

Non-linguistic sensitivity to context mediates predictability effects in sentence reading: An eye-movement study

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Word predictability is a consistent factor affecting eye movements during reading (Ehrlich & Rayner, 1981). However, little is known about how domain-general cognitive processes mediate the way readers respond to facilitation versus prediction error during sentence processing. Here, we examined the role of non-linguistic sensitivity to contextual cues in mediating readers' susceptibility to predictability manipulations. Forty-four native-English speakers (Mean age: 21; SD = 0.9) read sentences varying in predictability of the upcoming word (Predictable- Unpredictable-Neutral) while their eye movements were recorded. Non-linguistic sensitivity to context was tested by means of a cognitive control task, the AX-Continuous Performance Test (AX-CPT; Rosvold, Mirsky, Sarason, Bransome, & Beck, 1956). We asked whether non- linguistic sensitivity to contextual cues, as reflected in the AX-CPT, would be related to the magnitude of facilitation (Predictable vs Neutral) and/or prediction cost (Unpredictable vs Neutral) during reading. We report preliminary results from three eye-movement measures: gaze duration, regression-path duration, and total time, analyzed with linear mixed-effects models.

Fixed effects were predictability, coded as two contrasts (Neutral versus Predictable and Neutral versus Unpredictable) and AX-CPT. We found that prediction-error cost (Unpredictable vs Neutral) was mediated by AX-CPT in all three eye-movement measures (Gaze duration: $t = -2.09$, $p = 0.038$; Regression-path duration: -2.22 , $p = 0.028$; Total time: $p = -3.64$, $p < 0.001$), in that participants with more non-linguistic sensitivity to context experienced more processing difficulty when reading unpredictable words. This suggests that domain-general cognitive processes are particularly important at regulating predictability effects during reading.

References

- Ehrlich, S. F., & Rayner, K. (1981). Contextual effects on word perception and eye movements during reading. *Journal of verbal learning and verbal behavior*, 20(6), 641-655.
- Rosvold, H. E., Mirsky, A. F., Sarason, I., Bransome, E. D., & Beck, L. H. (1956). A continuous performance test of brain damage. *Journal of consulting psychology*, 20(5), 343.